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AN EXAMINATION OF BEEF AND PORK PRICE SPREAD COMPUTATION PROCEDURES

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Growing discontent with beef and pork price spread data, both within and outside the U.S. Department of Agriculture, was brought into full view by the report of the National Commission on Food Marketing. [2] The major concern of the Commission report in the area of meat price spreads was whether the total effect of specials is accounted for in the reported retail prices. At the same time, price spreads are also dependent on the level of the wholesale and farm values. Thus, these have also been a subject of concern.

As a result of the questions raised about the present spread series, a thorough examination of procedures currently used to calculate price spreads was undertaken. This article reports some of the revisions being considered in the procedure for estimating price spreads for beef and pork. Further work is currently in progress. Additional analysis is necessary before the decision will be made to change the procedures currently used to calculate price spreads.

Price spreads are defined as the differences between retail, wholesale, and farm values. For example, the farm-retail spread is the difference between the retail price and the farm value. Therefore, the proposed revisions discussed in the following paragraphs relate to the task of estimating accurate or representative retail prices, wholesale values, and farm values. The farm and wholesale figures are termed values, rather than prices, because they represent the value of the amount of the carcass or live animal equivalent to one pound at retail. Near the end of the article, a comparison is made between the current price spread series and proposed new series incorporating the changes indicated by our analysis to date.

Retail Prices

Average composite retail prices of both beef and pork are presently obtained by using Bureau of Labor Statistics (BLS) prices of individual cuts. BLS prices 7 cuts of beef and 6 cuts of pork. The present procedure assumes that the average price of all other cuts rises and falls in proportion to the cuts priced by BLS.

The proposed new procedure uses prices of all retail cuts to compute the composite prices. Retail prices for the additional cuts are obtained from a continuing survey of retail chain meat prices conducted by the Marketing Economics Division. This survey collects data from about 40 retail chain divisions throughout the United States.

Weekly to Monthly Data

BLS prices are collected during the first week of each month. As a result, the present retail prices are representative of 1 week within the month. The wholesale and farm values presently computed use data for the same week. The proposed method averages the prices for each week in the month, so that results obtained are more representative of the entire month. The chain survey collects prices each week and, thus, lends itself quite readily to this change. BLS prices would be adjusted to represent a monthly average, using data from the chain survey. Using a monthly average of weekly data, rather than 1 week's data should decrease the month to month fluctuations. Also, it would provide a more representative monthly estimate.

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[1] By Lawrence A. Duewer, Agricultural Economist, Marketing Economics Division, Economic Research Service, U.S. Department of Agriculture.

[2] National Commission on Food Marketing, Organization and Competition in the Livestock and Meat Industry, Technical Study No. 1, pp. 73-75, and Cost Components of Farm-Retail Price Spreads for Foods, Technical Study No. 9, pp. 5-7, Washington, D.C., June 1966.

Effect of Specials

The major changes proposed in the procedure for calculating average retail prices center around the inclusion of the total effect of specials. BLS prices that are presently used include about two-thirds of the specials conducted by the stores in the BLS sample. Data collected by Marketing Economics Division from a sample of chain stores include all special prices and regular prices. In the revised procedure, the chain data would be used to adjust BLS prices, thus obtaining a price including all specials, as well as a regular price including no specials.

Retail prices that include all specials, however, do not represent the total effect of specials on the average retail price if the average is obtained using carcass proportions. When an item is on special, a greater than usual amount is sold. In order to obtain the total effect of specials, this increased sales volume must be taken into consideration. If the volume sold, as well as the price of each cut, were obtained from each store, the total effect of specials could be calculated directly. But such data are not available. The portion of the total effect of specials on retail prices that can be obtained without volume information is called the "price effect." The "price effect" is determined by subtracting the average price including all special prices (specials-included price) from the average regular price.

The basic problem is to estimate the "volume effect," that is, the effect of special prices on the volume sold. Data collected during 5 months of 1965 in Washington, D.C. for the National Commission on Food Marketing indicated that price and volume effects were about equal. Thus, the procedure proposed for including the total effect of specials on retail prices consists of calculating the "price effect" and doubling it to include the "volume effect." This amount is then subtracted from the regular retail price to obtain a retail price that includes the total effect of specials.

In order to validate or determine more accurately the relationship between the price and volume effect, a study is presently being conducted in 5 cities. This study is very similar to the 1965 study mentioned above.

Wholesale Value

Computation of wholesale values of beef and pork are somewhat different. Each is fairly complicated. The present and proposed procedures do not vary much, so only the changes (rather than the entire method) will be discussed. A few small changes in weights assigned to pork products are proposed, in line with the trend to produce a greater proportion of meat-type hogs.

Calculation of wholesale values under the proposed procedures use monthly average data, rather than data for 1 week. A change also is proposed in the conversion factors used to estimate the quantity of carcass at wholesale equivalent to 1 pound of retail cuts. Conversion factors would be changed from 1.35 to 1.38 pounds for beef and from 1.00 to 1.04 pounds for pork to allow for retail shrink. The current conversion factors make no allowance for retail shrink. This shrink is the loss due to pilferage, refacing, dehydration, and spoilage after the meat is originally cut and packaged for sale. In order to obtain an accurate estimation of retail shrink, a small sample of stores will be studied in the near future. The results of this study may alter the proposed conversion factors.

An examination of volume of movement data is also being undertaken to determine whether to use carlot or less-than-carlot wholesale prices, or a combination of the two, and which geographical distribution and weighting of reported prices would be most representative. Additionally, wholesale and live animal prices and movements are being examined to determine the representativeness of different beef cattle weights and grades and steer-versus-heifer data.

Farm Value

Net farm value is defined as the payment to the farmer for the quantity of live animal, excluding byproducts, equivalent to 1 pound of retail cuts. In the computations of farm value, the change from 1 week to average monthly data is again proposed. The suggested changes in the conversion factors used to equate the quantity of live animal equivalent to 1 pound at retail are from 2.25 to 2.30 pounds for beef and 2.00 to 2.09 pounds for pork. These changes would allow for retail shrink.

Present farm value computations for both beef and pork are based mainly on the prices of steers, heifers, and hogs published by the Statistical Reporting Service (SRS). The proposed procedure involves the use of 20 terminal market prices for 900 to 1,100 pound Choice steers. Terminal market prices are collected by the Market News Service. These prices from the different markets would be weighted according to volume. For pork, it is proposed to use the weighted average price of barrows and gilts from 8 markets reported by the Market News Service.

In order to calculate a farm price from the terminal market prices obtained, marketing costs incurred by farmers must be subtracted. Marketing costs include yardage, commission, and transportation charges. A more thorough study is being made, but present findings indicate farmers' marketing costs average $0.65 per 100 pounds live weight for beef and $0.75 per 100 pounds for pork.

Use of the farm price (market price minus marketing cost) adjusted by the conversion factor to retail weight equivalent provides the gross farm value from which the byproduct value must be subtracted. No changes are anticipated in the procedure for calculating byproduct values. However, for pork, the weights used for various byproducts have been updated to reflect the gradual improvement in hog quality over time. Subtracting byproduct values provides the revised farm values for beef and pork.

Comparison of Current and Revised Series

Retail Price

The revised retail price of Choice beef averaged 2.1 cents per pound lower than the present series from January 1965 to August 1967. The pork price averaged 1.6 cents less (tables 10 and 11). Most of the decline results from including the total effect of specials.

Wholesale Value

The revised wholesale values are higher than the present series. The wholesale value averaged 1.5 cents higher for beef and 1.0 cent higher for pork. This increase stemmed mainly from the addition of the retail shrink factor. The examination of carlot and less-than-carlot prices mentioned earlier may indicate that more carlot prices should be used. This would tend to lower the wholesale value.

Table 10.--Choice beef: A comparison of the currently reported retail prices, wholesale values, farm values and spreads with a proposed revised series, by months, 1965-67

Year and month	Retail price per pound 1/		Wholesale value 2/		Net farm value 3/		Farm-wholesale spread		Wholesale-retail spread		Farm-retail spread	
	Current	Revised	Current	Revised	Current	Revised	Current	Revised	Current	Revised	Current	Revised
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1965												
January	78.9	76.4	53.8	55.7	43.7	47.5	10.1	8.2	25.1	20.7	35.2	28.9
February	78.4	75.7	53.6	55.0	43.4	47.0	10.2	8.0	24.8	20.7	35.0	28.7
March	78.5	75.0	53.6	55.6	42.9	48.1	10.7	7.5	24.9	19.4	35.6	26.9
April	78.3	77.2	55.5	57.4	45.3	50.3	10.2	7.1	22.8	19.8	33.0	26.9
May	79.2	79.2	58.4	61.0	47.7	53.4	10.7	7.6	20.8	18.2	31.5	25.8
June	84.1	82.7	62.4	62.4	51.8	55.3	10.6	7.1	21.7	20.3	32.3	27.4
July	85.0	83.4	61.2	61.9	50.0	53.6	11.2	8.3	23.8	21.5	35.0	29.8
August	83.9	82.9	59.9	61.2	47.8	52.5	12.1	8.7	24.0	21.7	36.1	30.4
September	83.8	82.2	59.8	60.8	47.8	52.7	12.0	8.1	24.0	21.4	36.0	29.5
October	83.2	81.1	58.3	59.2	46.8	51.9	11.5	7.3	24.9	21.9	36.4	29.2
November	82.5	81.8	57.4	58.2	46.5	50.8	10.9	7.4	25.1	23.6	36.0	31.0
December	82.9	82.0	57.8	59.1	47.5	51.3	10.3	7.8	25.1	22.9	35.4	30.7
1966												
January	83.3	80.9	58.0	60.6	47.9	52.2	10.1	8.4	25.3	20.3	35.4	28.7
February	84.4	82.3	60.3	62.1	50.3	54.1	10.0	8.0	24.1	20.2	34.1	28.2
March	86.1	83.5	63.4	64.4	55.8	56.5	7.6	7.9	22.7	19.1	30.3	27.0
April	86.7	84.9	62.5	62.6	52.6	54.5	9.9	8.1	24.2	22.3	34.1	30.4
May	85.2	83.5	59.4	60.4	51.4	51.9	8.0	8.5	25.8	23.1	33.8	31.6
June	84.5	81.0	57.9	58.7	48.5	50.6	9.4	8.1	26.6	22.3	36.0	30.4
July	84.1	80.6	57.6	58.6	48.7	50.2	8.9	8.4	26.5	22.0	35.4	30.4
August	84.3	81.1	57.9	59.5	48.8	51.1	9.1	8.4	26.4	21.6	35.5	30.0
September	84.6	81.3	59.2	60.2	49.6	51.1	9.6	9.1	25.4	21.1	35.0	30.2
October	84.5	80.5	57.6	58.3	48.0	49.8	9.6	8.5	26.9	22.2	36.5	30.7
November	83.1	80.2	55.6	57.4	45.8	48.9	9.8	8.5	27.5	22.8	37.3	31.3
December	83.8	83.6	57.1	58.6	47.4	49.2	9.7	9.4	26.7	25.0	36.4	34.4
1967												
January	83.0	79.7	57.8	59.8	47.9	50.6	9.9	9.2	25.2	19.9	35.1	29.1
February	83.5	80.8	57.3	58.5	48.0	49.5	9.3	9.0	26.2	22.3	35.5	31.3
March	82.9	80.5	56.5	57.3	48.2	48.7	8.3	8.6	26.4	23.2	34.7	31.8
April	82.2	80.2	56.4	58.5	47.4	49.1	9.0	9.4	25.8	21.7	34.8	31.1
May	81.8	78.8	57.3	60.2	46.5	51.0	10.8	9.2	24.5	18.6	35.3	27.8
June	83.9	82.2	60.9	62.1	50.0	52.4	10.9	9.7	23.0	20.1	33.9	29.8
July	84.1	83.1	61.7	63.2	51.4	53.6	10.3	9.6	22.4	19.9	32.7	29.5
August	84.7	83.7	61.4	63.7	50.9	54.4	10.5	9.3	23.3	20.0	33.8	29.3
Average Jan. 1965-Aug. 1967	83.1	81.0	58.3	59.8	48.3	51.4	10.0	8.4	24.8	21.2	34.8	29.6

1/ Estimated weighted average price of retail cuts. 2/ Wholesale value of quantity of carcass equivalent to 1 lb. of retail cuts.
3/ Payment to the farmer for the quantity of live animal, excluding byproducts, equivalent to 1 lb. of retail cuts.

Table 11.--Pork: A comparison of the currently reported retail prices, wholesale values, farm values and spreads with a proposed revised series, by months, 1965-67

Year and month	Retail price per pound 1/		Wholesale value 2/		Net farm value 3/		Farm-wholesale spread		Wholesale-retail spread		Farm-retail spread	
	Current	Revised	Current	Revised	Current	Revised	Current	Revised	Current	Revised	Current	Revised
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1965												
January	56.4	55.1	40.5	41.7	27.1	28.6	13.4	13.1	15.9	13.4	29.3	26.5
February	56.9	54.0	41.5	41.7	29.6	30.4	11.9	11.3	15.4	12.3	27.3	23.6
March	57.2	54.8	42.0	42.5	28.6	30.2	13.4	12.3	15.2	12.3	28.6	24.6
April	57.4	54.4	43.4	43.2	30.0	31.4	13.4	11.8	14.0	11.2	27.4	23.0
May	58.0	58.8	44.6	47.0	33.0	36.8	11.6	10.2	13.4	11.8	25.0	22.0
June	63.8	63.7	50.5	52.2	38.1	42.9	12.4	9.3	13.3	11.5	25.7	20.8
July	68.4	69.1	53.7	55.0	41.8	44.7	11.9	10.3	14.7	14.1	26.6	24.4
August	70.3	70.1	55.3	55.4	41.8	45.5	13.5	9.9	15.0	14.7	28.5	24.6
September	70.5	70.1	53.5	53.7	38.7	41.8	14.8	11.9	17.0	16.4	31.8	28.3
October	69.7	69.5	52.8	53.6	40.1	42.5	12.7	11.1	16.9	15.9	29.6	27.0
November	69.4	69.1	53.7	55.8	40.9	44.6	12.8	11.2	15.7	13.3	28.5	24.5
December	72.9	75.7	62.1	62.4	50.0	52.1	12.1	10.3	10.8	13.3	22.9	23.6
1966												
January	77.6	76.5	60.3	62.2	47.5	51.3	12.8	10.9	17.3	14.3	30.1	25.2
February	78.8	78.2	60.5	62.0	48.7	51.0	11.8	11.0	18.3	16.2	30.1	27.2
March	78.0	75.0	56.7	57.2	42.7	44.4	14.0	12.8	21.3	17.8	35.3	30.6
April	73.3	69.3	53.4	53.4	39.3	40.4	14.1	13.0	19.9	15.9	34.0	28.9
May	71.6	68.4	51.7	53.8	37.9	42.3	13.8	11.5	19.9	14.6	33.7	26.1
June	72.3	71.2	54.4	56.3	42.5	45.6	11.9	10.7	17.9	14.9	29.8	25.6
July	72.9	71.5	56.2	56.6	43.9	46.4	12.3	10.2	16.7	14.9	29.0	25.1
August	73.4	74.1	57.4	57.6	44.5	47.3	12.9	10.3	16.0	16.5	28.9	26.8
September	73.9	71.8	53.3	54.6	41.3	42.3	12.0	12.3	20.6	17.2	32.6	29.5
October	72.5	69.3	53.7	52.4	37.9	39.4	15.8	13.0	18.8	16.9	34.6	29.9
November	69.5	66.4	49.2	49.6	34.1	36.2	15.1	13.4	20.3	16.8	35.4	30.2
December	67.7	65.1	50.9	51.1	34.5	36.0	16.4	15.1	16.8	14.0	33.2	29.1
1967												
January	67.5	64.5	49.8	49.9	33.6	35.6	16.2	14.3	17.7	14.6	33.9	28.9
February	66.6	63.7	47.1	48.0	33.5	35.4	13.6	12.6	19.5	15.7	33.1	28.3
March	65.8	61.6	45.7	46.4	32.7	33.6	13.0	12.8	20.1	15.2	33.1	28.0
April	64.6	60.3	44.2	45.0	30.1	32.0	14.1	13.0	20.4	15.3	34.5	28.3
May	63.7	63.1	44.5	51.2	31.3	40.4	13.2	10.8	19.2	11.9	32.4	22.7
June	69.1	67.8	52.5	53.0	39.3	41.4	13.2	11.6	16.6	14.8	29.8	26.4
July	69.2	68.6	52.7	54.1	41.1	42.1	11.6	12.0	16.5	14.5	28.1	26.5
August	69.8	68.2	51.8	51.7	38.5	39.0	13.3	12.7	18.0	16.5	31.3	29.2
Average Jan. 1965-Aug. 1967	68.4	66.8	51.2	52.2	38.0	40.4	13.2	11.8	17.2	14.6	30.4	26.4

1/ Estimated weighted average price of retail cuts. 2/ Wholesale value of quantity of carcass equivalent to 1 lb. of retail cuts.
3/ Payment to the farmer for the quantity of live animal, excluding byproducts, equivalent to 1 lb. of retail cuts.

Farm Value

Farm values averaged 3.1 cents higher for beef and 2.4 cents higher for pork, using the proposed procedure. Again, including retail shrink caused part of the increase. In addition, using terminal market steer prices and changing the byproduct weights for pork tended to raise the farm value. Subtracting farmer marketing costs from terminal market prices, instead of using SRS farm prices, also affected farm values obtained.

Spreads

An average decrease of 5.2 cents in the farm-retail spread for beef and 4.0 cents in the farm-retail spread for pork resulted from use of the proposed procedure. The wholesale-retail spread for beef decreased 3.6 cents. Pork decreased 2.6 cents. The farm-wholesale spread decreased 1.6 cents for beef and 1.4 cents for pork.

These figures represent average relationships for the period. The data for the individual months varied around these averages. Some variation for a specific month resulted from the present series reflecting values for a specific week within the month, while the revised figures represent the average for the month. Thus, for a month of rapidly rising or falling prices, variation between the 2 methods might be quite large. A good example is the pork price-spread data for May 1967. Most of this variation, however, would be eliminated by using averages for a longer period.

Estimates obtained using the revised procedures suggest that the farmer may be receiving a higher proportion of the consumer's dollar than presently reported. They also indicate that the retailing margin may not be as large as previously reported.

Summary

New procedures for calculating beef and pork spread data are being examined. Some tentative revisions have been suggested, but are being studied to verify the new procedures. Use of monthly averages and an estimated retail shrink have been proposed. New procedures have been developed to more fully include the effect of specialing and to more accurately determine the value obtained by the farmer.

Several other studies are now in progress to further examine the current procedures and to refine the revisions presently suggested. This work should be completed in about a year. Tables comparing the present and proposed revised series indicate the directions and amounts of change for 1965-67.

In the interim period, while revisions are evaluated, official USDA price spread statistics will continue to be computed and published in the same manner as in the past.